I. Project Title and Project Purpose Statement

Title for the project: Pinedale Solar Energy Empowerment Project (SEEP)

Summary description. With over three years of experience partnering with the affected community, Eagle Energy proposes the Pinedale Solar Energy Empowerment Project (SEEP), which seeks to increase access to and use of solar heaters, lights and charging devices in the Pinedale Chapter of the Navajo Nation, located in Northwestern New Mexico. By increasing access to these products, the Pinedale SEEP will decrease the harmful health and environmental impact of indoor air pollution, reduce the CO_2 emissions resulting from burning solid fuels and will increase economic outcomes in Pinedale.

The Pinedale SEEP will provide education about the benefits of clean energy, training and capacity building, and access to life-enhancing products that will bring a clean source of energy to non-electrified community-members. Specific goals of the Pinedale SEEP include:

- Increase indoor air quality, reduce indoor particulate matter and reduce CO_2 emissions based on the collection of baseline and comparison data
- Increase employment and training in the Pinedale Chapter by providing 5–7 individuals with training on the retrofitting, installation and care of solar heaters
- Install 30 solar heaters on 30 homes
- Install 30 Goal Zero Yeti 150 systems
- Install one Sun King Pro light/charger and two Nokero lights for up to 150 homes
- Increase individual customer savings by an average of $15 per month, or $180 annually

Location. The proposed project will take place in the Pinedale Chapter of the Navajo Nation, located in a Census designated Tribal Subdivision/Remainder (or part) within State. Located 22 miles east of Gallup, New Mexico, the Pinedale Chapter is in the Eastern Agency of the Navajo Nation and the Northwestern corner of New Mexico.

Related environmental statute. The Pinedale SEEP seeks to impact the *Clean Air Act, Section 103(b)(3).* While the 2010 Census estimates that 77% of households in the Pinedale Chapter are burning wood for heat, data about electrification and the health and environmental impacts of the use of dirty fuels on the Navajo Nation are very limited. This project seeks to contribute to the data available for this community. By monitoring indoor air pollution, electricity and heat needs and use, and by comparing baseline and follow-up data from program participants, the Pinedale SEEP will contribute to a growing body of work on the positive health, environmental and economic impacts of clean energy use.

List project partners. The following multi-sector project partners have submitted Memoranda of Agreement, offering their support and commitment to the Pinedale SEEP:

- **Elephant Energy** (*dba* Eagle Energy in Indian Country), the project lead, is a 501(C)(3) with a mission to "improve the quality of life in developing communities by pioneering ventures that provide access to appropriate sustainable energy technologies."
- **Pinedale Chapter** is the local governmental agency that governs actions in the Pinedale Chapter. The Chapter demonstrated its commitment to Eagle Energy in two Tribal Resolutions–one passed in 2010 and the other passed in 2013. Pinedale's 2015–2020 Infrastructure Capital Improvement Plan calls for a project to plan, design and construct solar panels for the rural community, making the proposed Pinedale SEEP a well-aligned community initiative.
- **Namaste Solar** is a private, Colorado-based solar installation company with a mission to "propagate the responsible use of solar energy, pioneer conscientious business practices,

and create holistic wealth for ourselves and our community."

- **Colorado School of Public Health at the University of Colorado Denver** will provide research and academic support throughout project implementation.

II. Environmental and/or Public Health Information about the Affected Community

The Navajo Nation covers 27,000 square miles in the Four Corners region of the U.S., with Chapters located in Utah, Arizona and New Mexico. Encompassing some of the most beautiful landscapes in the Southwest, visitors on the Navajo Nation are in awe of the majestic rock towers and formations in Monument Valley, the 100+ miles of fantastic Lake Powell shoreline and the beautiful pueblos of Chaco Culture National Historical Park. What many visitors don't see, however, are the high levels of poverty, the incredible disconnect from modern conveniences, such as electricity and utility heat, and the numerous environmental and public health issues that accompany this lack of access to common services. A unique combination of political, cultural and environmental factors contribute to keeping these communities disconnected from common services, but perhaps the most pervasive challenge is a lack of access to the necessary capital and community coordination required to make these services more available. The Pinedale Solar Energy Empowerment Project (Pinedale SEEP) seeks to create high levels of community coordination in an effort to seek creative solutions to this longstanding community challenge.

The local environmental and public health issue the Pinedale SEEP seeks to address is high levels of air pollution, directly related to the continued lack of access to basic community services–including clean sources for heat and electricity. In order to address this issue, and pursuant with the Request for Applications, the Pinedale SEEP will include activities related to the Clean Air Act, Section 103(b)(3).

Cata (2012) boldly states: "Electricity is arguable the single-most vital component to advancing rural economic development and improving the overall health and well-being of communities." Despite this, there are an estimated 18,000 households on the Navajo Nation in the United States that lack access to electricity. That number represents 75% of all homes in the United States that are without this fixture of modern life. Navajo people living in homes without power are forced to rely on sub-par energy sources such as kerosene lanterns, candles, single-use batteries and generators. These energy sources are expensive, unhealthy, can pose a fire hazard and often produce poor quality light. These "dirty fuels" are contributing to increased emissions of carbon dioxide (CO_2) and are contributing to the U.S.'s standing as second in the world when it comes to CO_2 emissions.[1] In fact, 81.5% of CO_2 emissions in the U.S. are a direct result of energy-related activities. For example, when the average kerosene lantern is used for four hours of electricity per night, it produces over 100 kilograms of CO_2 emissions per year.[2] That means that if each of the 18,000 households on the Navajo Nation that lacks access to electricity uses only one lantern, the net greenhouse gas emissions equate to 1.8 million kilograms per year. This is equal to driving over four million miles in the average car.

Further, the World Health Organization has documented health risks associated with indoor use

[1] Cata (2012). Sustainable Rural Electrification: Residential Solar Energy on the Navajo Nation. http://apps1.eere.energy.gov/tribalenergy/pdfs/cata_2012.pdf

[2] http://navajopeople.org/blog/bringing-lights-to-navajo-homes/

of fuels such as kerosene, concluding that "smoke causes respiratory infections, lung, and throat cancers and cataracts."[3] Switching to solar-charged LED lighting and charging appropriate sustainable energy technologies will significantly improve indoor air quality at home.[4] A reduction in the use of conventional off-grid energy sources will also contribute to the reduction of CO_2 in an area that already produces substantial amounts of greenhouse gasses. Several major coal-fired power plants impact air quality in the Four Corners Region through their emission of particulate matter and exacerbate climate change by emitting CO_2. The communities on the Navajo Nation that lack access to clean energy are disproportionately impacted by the environmental harms associated with dirty fuels.

Characteristics of the affected community. Located near the Northwestern border of New Mexico, within the Eastern Agency of the Navajo Nation, the Pinedale Chapter covers 41,000 acres or just over 64 square miles, and has become known for being home to the largest abandoned uranium mine on the Navajo Nation. This mine, which closed in 1982, is now a high priority Superfund Site for the U.S. Environmental Protection Agency.

As of the 2010 Census, the population was 1,109 individuals–lending itself to a population density of 17 people per square mile. This Chapter, which has seen its share of environmental and public health tragedies is still experiencing high levels of poverty, low levels of educational attainment and even lower access to common public services. According to the 2006–2010 American Community Survey, 54% of the population earned income below the poverty level and 51.2% of the population had obtained a high school degree or equivalent. Further, according to the 2000 Census, 77% of households used wood as their primary heating source.

Disproportionate impact. While only 1.4% of the households in the U.S. lack access to electricity, nearly 75% of those households are found on Native American reservations. In total, 14.2% of households on reservations have no access to electricity. While lack of energy access is a challenge throughout Indian Country, the Navajo Nation is bearing the brunt of the problem. In 2000, the Energy Information Administration estimated that 37% of the Navajo Nation was without access to electricity–accounting for 75% of all Indian households without electricity.[5]

The Navajo Nation is comprised of over 110 Chapters, each with a semi-autonomous Native-run government. While Eagle Energy has successfully partnered with numerous Chapters throughout the Eastern and Western Agencies of the Navajo Nation, the Pinedale Chapter has been selected as the affected community because of a Chapter commitment to solar energy, and Eagle Energy's longstanding relationship with the Chapter. With higher-than-average levels of poverty, the Pinedale Chapter is even more negatively impacted by the lack of electrification.

While many factors contribute to the lack of electrification on the Navajo Nation, the primary factors include:

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[3] WHO-SELF Newsletter, 2002

[4] J. Apple, *Characterization of particulate matter size distributions and indoor concentrations from kerosene and diesel lamps*, 20 INDOOR AIR 399, 399-411, (May 11, 2010).

[5] Cata (2012). Sustainable Rural Electrification: Residential Solar Energy on the Navajo Nation. http://apps1.eere.energy.gov/tribalenergy/pdfs/cata_2012.pdf

Low population density leading to high costs of grid line extension: With an estimated population of 169,052, occupying roughly 27,000 square miles, the average population density across all of the Navajo Nation is 6.3 people per square mile, compared with the U.S. average of 88 people per square mile and the Washington, D.C. high density of 10,357 people per square mile.[6] On top of incredibly low population density, it's estimated that non-electrified houses in some parts of the Navajo Nation can be 1 to 45 miles away from the electrical grid. Compounding this, Battiest (2004) estimated that the cost of constructing line extensions would be between $35,000 and $80,000 per mile[7] and Bain (2004) estimates that based on these prices, it could cost as much as $350 million over ten years to bring electricity to the 37% of households on the Navajo Nation without access to grid electricity. The Navajo Tribal Utility Authority, which services around 39,400 electrical customers in Navajo Nation, only provides funding for electrical line extension in communities with more than eight homes per mile, a threshold that is rarely reached in many parts of the Navajo Nation.[8]

Unique customer base: Cultural and political dynamics on the Navajo Nation also contribute to a lack of electrification. Due to its semi-autonomous structure, the Navajo Nation receives very limited support from the federal government. In addition, because of land use and property lines on the Navajo Nation, the right of way clearances required to install new electric lines make utility projects cost and time prohibitive.

High rates of poverty and low rates of access to up-front capital: In the Pinedale Chapter, the median household income is $25,518 (compared with $26,232 on the Navajo Nation as a whole) and 53.9% of people had income in the last 12 months below the poverty level (compared with 37.7% on the Navajo Nation as a whole). Due to the high costs associated with grid line extension, the lack of utility provider support and a lack of access to up front capital, many individuals and families in the Pinedale Chapter simply cannot afford the transition to clean energy.

III. Organization's Historical Connection to Affected Community

History of involvement with the affected community. Elephant Energy (*dba* Eagle Energy in Indian Country) is a 501(c)(3) that was formed in 2008 a with a mission "To improve the quality of life in developing communities by pioneering ventures that provide access to appropriate sustainable energy technologies." Shortly after founding Elephant Energy, which works primarily in the Southern African countries of Namibia and Zambia, the founder entered into a partnership with the University of Colorado Boulder to conduct research on renewable energy sources and their viability in the Navajo Nation. In 2010, while conducting on-the-ground research on renewable energy products in the Navajo Nation, Elephant Energy's founder was surprised to recognize the environmental, cultural and political similarities between the Navajo Nation and his work in Namibia. With the support of an outreach grant from the University of Colorado, Eagle Energy began operating in the Navajo Nation in the spring of 2010. In the long-term, Eagle Energy's goal is to eradicate kerosene, propane, and alkaline battery use for lighting

[6] http://en.wikipedia.org/wiki/List_of_U.S._states_by_population_density
[7] Cata (2012). Sustainable Rural Electrification: Residential Solar Energy on the Navajo Nation. http://apps1.eere.energy.gov/tribalenergy/pdfs/cata_2012.pdf
[8] *ibid.*

on the Navajo Nation and Hopi Reservation. Working in partnership with reservation-based nonprofits, local Chapters (local governments), Community Health Representatives and community leaders, over the past three years Eagle Energy has distributed solar lights and surveyed individuals on the Navajo Nation to better understand their needs. The Pinedale Chapter was the first Chapter to partner with Eagle Energy in 2010 and it remains the organization's strongest Chapter supporter.

Eagle Energy operates three primary projects in partnership with various local entities. First, the *Western Agency Solar Energy Empowerment Project (SEEP) pilot,* which seeks to provide solar technologies to vulnerable elders and school children, and to other Navajo people via a network of rural sales agents. Second, and also in partnership with the University of Colorado, Eagle Energy initiated the *Navajo Women's Energy Project* to develop women-focused solutions to energy access problems on the Reservation. Finally, Eagle Energy implemented a *Solar Heater Project* on the Navajo Nation to reduce wood-use and heating costs and increase family and household health. Through these strategies, Eagle Energy strives to address the basic energy needs of all Navajo people.

In January 2013, Eagle Energy began working with Namaste Solar, a Colorado-based solar installation company, to recycle Solaron solar heating panels ("solar collectors") consisting of six-foot by three-foot metal boxes with specialized glass and black collector surfaces. Solar air collectors, also known as solar air heaters, operate on a very simple principle. They use the heat produced by sunshine to heat up air, which is then blown into the home to reduce the heating load requirements of a home. The systems use a special type of glass and heat surface designed to absorb a wide spectrum of the sun's rays. Eagle Energy's initial solar collector retrofit training was conducted in June 2013, when Melton Martinez conducted a two-day training focused on stripping old soft insulation, installing new hard insulation in the collectors, and linking the retrofitted collectors in series and installing a blower and necessary ducts.

In September 2013, Mr. Martinez organized a training at Pinedale Chapter to install a demonstration solar heating system. Participants from six partner organizations attended this training for a total of 17 participants. A home was chosen that was close to the Pinedale Chapter House so that the system could be easily monitored during the winter. At the site, the participants cut holes in the south side of the home, mounted the blower in an enclosed box, connected ducting and wired a switch on the interior of the home to the blower. Upon flipping the switch, the heater immediately pumped hot air into the bedroom of the home despite the clouds and temperature of 40 degrees. This demonstration project was important to begin generating excitement in the Pinedale Chapter for the solar collectors and the Pinedale SEEP.

Work with the affected community's residents and/or organizations. In order to address the local environmental and public health issues present in the Navajo Nation, Eagle Energy partners closely with Chapters, local nonprofit organizations and Community Health Representatives (CHRs) to establish and test systems of developing supply and demand for appropriate sustainable energy technologies (ASETs) on the Navajo Nation. In 2013, Eagle Energy and its partners successfully changed the lives of people living in ***109 households through the distribution of 322 solar products and partnered with nine schools to distribute an additional 270 products.***

While the solar products distributed to vulnerable households and schools were given free of charge to address the needs of people on the Navajo Nation, Eagle Energy's main focus is on working with local businesses and entrepreneurs to create a sustainable, market-based distribution network for these products. The most effective way to create sustainable access to solar energy for people living without access to electricity is to form partnerships with entrepreneurs, replacing kerosene and dirty fuels on the shelves with solar products. In its work with entrepreneurs, Eagle Energy strives to be culturally aware and relevant by encouraging the use of the Navajo language, addressing the tradition of bartering, using marketing strategies that address Navajo cultural practices, and offering energy technologies that are "rez-tested and grandma approved."

Residents and organizations as part of the decision-making process. Eagle Energy has been partnering with Pinedale Chapter since 2010, when the initial renewable energy research was conducted. Through initial research, which included community meetings and conducting baseline surveys, Eagle Energy and its partners in Pinedale determined that small-scale solar technologies would help address the energy needs of the community, while simultaneously addressing the environmental/public health challenges. Based on survey data that Eagle Energy collected from four Chapters in the Navajo Nation, 34% of respondents indicated they used generators or batteries for their electricity needs and 22% indicated they had no access to electricity. Based on these findings, Eagle Energy forged partnership with local organizations and with local CHRs and Public Health Nurses (PHNs) to help engage the local community and its residents in the decision-making process. In addition, as part of its initial needs assessment, Eagle Energy tested various products to determine their efficacy and utility in the Navajo Nation.

In addition to working with local organizations and healthcare professionals, in 2013 the Pinedale Chapter passed Resolution 12-13-013, making official the Chapter's support of Eagle Energy's renewable energy initiatives in the Chapter. This Resolution renews the 2010 Chapter Resolution that initiated Pinedale's partnership with Eagle Energy.

Finally, in 2013 Eagle Energy began partnering with Melton Martinez, the president of the Eastern Navajo Uranium Workers and the proposed project manager, who has been managing the solar heaters work in the Eastern Agency of the Navajo Nation. As a community activist, Mr. Martinez has provided significant support to increase Eagle Energy's presence in the Eastern Agency.

Increased capacity on the part of local community. Eagle Energy believes that community buy-in is essential for sustainable development, and that projects should empower individuals to help themselves. As such, while Eagle Energy will remain engaged as long as is beneficial for each community, the long-term goal is to create a network that can thrive on its own without Eagle Energy's continued involvement. To do this, the organization partners with the local community to increase its understanding of the public health issue and to build its capacity to do the work largely unassisted.

In an effort to increase understanding of the public health issue, Eagle Energy partners with schools throughout the Navajo Nation to teach children and the community at large about the

environmental, public health and economic benefits of solar and other clean technologies. Eagle Energy also conducts educational outreach with the Chapters, where information about the benefits of solar and other clean technology is shared with community members.

Finally, in order to build community capacity, in 2013, Melton Martinez began providing training and capacity building for individuals and organizations in Chapters located in the Eastern Agency of the Navajo Nation. To date, 40 individuals have received training in the process of retrofitting, installing and conducting basic maintenance on the solar heaters that are being installed throughout the Eastern Agency.

Ongoing relationship-building and maintenance. Since 2010, Eagle Energy has maintained and sustained an ongoing relationship with the Pinedale Chapter that cuts across many sectors. To help navigate the sometimes challenging cultural and political dynamics at play on the Navajo Nation, Eagle Energy intentionally selects and cultivates relationships with key community members–bridge builders–who can help establish organizational credibility and who can help deepen Eagle Energy's connection to the Chapter.

IV. Project Description

The Pinedale SEEP will result in increased access to clean energy, and increased health and environmental benefits for the Pinedale community. Further, the Pinedale SEEP will provide valuable, community-focused data and information about the current environmental and public health challenge and will help inform future initiatives that are seeking to improve air quality and increase access to clean fuels.

Local environmental and/or public health results the project seeks to achieve. Pursuant with the Request for Applications, the Pinedale SEEP seeks to impact the Clean Air Act Section 103(b)(3), by conducting research and monitoring, and by implementing demonstration projects related to the causes, effects and prevention of air pollution. Smith et al (2005) found that indoor smoke from solid fuels is responsible for 1.6 million premature deaths each year, making it nearly on par with a lack of malaria control globally.[9] In the Pinedale Chapter, an estimated 77% of households rely on wood for heat, and other dirty fuels, such as kerosene, batteries, generators and solid fuels for electricity needs. The Pinedale SEEP seeks to achieve decreased indoor air pollution through the use of clean energy technologies

Community benefit. The Pinedale SEEP will achieve these results through education and capacity building, as well as through the installation of solar heaters, lights and chargers:

Phase 1: Market research, baseline data collection and test installations (months 1–2)
In order to create a market-based approach to distribution, and to increase buy-in, Pinedale Chapter and Eagle Energy will ask each recipient to pay a reasonable amount to cover some of the expenses incurred by the installation crew will ensure that the recipients have true ownership of their systems. To determine this fee, Phase 1 of this project will involve surveying individuals

[9] Smith (n.d.) Global Burden of Disease and Comparative Risk Assessment: The New Assessment for Household Air Pollution from Cooking Fuels. Accessed from: http://ehs.sph.berkeley.edu/krsmith/scrig/presentations/gbdcra.pdf

in the Pinedale community to understand average household heating costs. Pinedale Chapter and Eagle Energy will then determine a monthly amount to charge recipients such that they receive the savings benefits immediately but can help cover some of the costs to pay laborers to install the solar heaters. Eagle Energy does not anticipate that recipients will pay for the full cost of systems, but will pay some of the expenses incurred, namely installation costs.

In addition, the Pinedale Chapter will work with Eagle Energy to perform two test installations in the area. These pilot demonstrations will familiarize Pinedale Chapter and its primary implementing partners with the products and will also allow the group to proactively address any unanticipated challenges before the effort is scaled up. Pinedale will select recipients who are easily accessible and who will have regular contact with Mr. Martinez.

Finally, Phase 1 will include the collection of baseline public health data to measure the environmental and public health challenge in the community. Partnering with advisors from the Colorado School of Public Health at the University of Colorado Denver and the local community, the Pinedale SEEP will develop and distribute baseline surveys to assess the health of individuals who rely on wood and kerosene for their heating and electricity needs. Aligning with the goals of the Collaborative Problem-Solving process, Eagle Energy will work closely with the local community to determine public health measures that are important to it, rather than imposing standardized public health and environmental surveys/measures on the community.

Phase 2: Training and capacity building (months 3–5)
Phase 2 will consist of hiring and training work crews for the installation of solar heaters and other clean technology. Eagle Energy plans to train and hire an estimated five to seven individuals to conduct the retrofitting and installation of solar heaters. In addition to the trainings provided by Mr. Martinez, Tim Willink and Benny Faraone from Namaste Solar will assist with the training and installation planning processes. With extensive experience in retrofitting and installing these solar heaters, the team from Namaste will be instrumental in the community capacity-building component of the Pinedale SEEP.

Phase 3: Large-scale launch (months 6-10)
Phase 3 will mark the launch of the installation effort throughout the Pinedale Chapter. At this stage, the time and resources required for installations will be well understood, and Mr. Martinez and crew will begin to perform installations for recipients in the Pinedale area.

During the project period, the team will install 30 solar heaters on 30 homes in configurations of one to four collector panels each. In total, 90 solar air collector panels will be retrofitted and installed. In addition, the project will install 30 Goal Zero solar home systems on the homes of families without access to electricity. Finally, by the end of the project, every home in Pinedale Chapter (up to150 homes total), even those with access to electricity, will receive a Sun King Pro lamp/charger and two Nokero lights as task and outhouse lights. This distribution will be conducted to ensure Chapter-wide engagement in the project.

In Phase 3, Eagle Energy will shift its efforts to the vital business support services. Dedicated staff and volunteers with expertise in marketing, accounting, operations and other areas, will regularly consult with Mr. Martinez on the venture. Though the initial phases of the project will

be supported by grant funds, everything the partners do will be focused on the eventual goal of the solar air collector project becoming a viable, self-supporting business.

Phase 4: Follow-up surveying, project wrap-up, reporting & knowledge sharing (months 11–12)
Several important activities must be performed during this final phase to ensure the project is sustainable. Pinedale and Eagle Energy will conduct a wrap-up meeting with Mr. Martinez and his team of installers. Once Pinedale and Eagle Energy have learned about the issues, opportunities, challenges from this group, they will conduct a larger meeting with all Chapter residents to discuss the findings. Further, and in partnership with the Colorado School of Public Health at the University of Colorado Denver and the local community, Eagle Energy will develop follow-up public health surveys to assess the health of community members who received solar heaters. While surveys will be designed to be responsive to and helpful for the affected community, Eagle Energy anticipates the surveys will explore monthly heating and electricity costs since installation, and levels of indoor air pollution.

Results of all follow-up surveys and community conversations will be synthesized into a report about how the program can be improved and changed to maximize its chances for continuing in the future. Eagle Energy will make the final report available on its website in order to further the project goal of knowledge sharing.

Collaborative problem solving model elements.
1. Issue identification, vision and strategic goal setting: Eagle Energy has been engaging the Pinedale community in this element of CPS since it began its work in 2010. Pinedale's 2015-2020 Infrastructure Capital Improvement Plan calls for a project to plan, design and construct solar panels for community members that reside in rural areas of the community. Because Pinedale Chapter's population is increasing due to the economy in nearby border towns, the waiting time is now three to four years for new families to be considered for a power line/house-wiring project. As such, the Pinedale SEEP is appropriately timed to support the expansion of solar infrastructure in the Chapter. Building on this existing community plan, leveraging leadership in the Chapter, and partnering with key community organizations is helping Eagle Energy to 1) create a vision that articulates the desired outcomes to be achieved, and 2) develop a strategy that identifies the actions needed to produce results.
2. Community capacity-building and leadership development: Much of the Pinedale SEEP is grounded in community capacity-building, both to increase awareness of the environmental and public health challenges created by the use of dirty fuels, and to increase community engagement in the process. Through Phases 1 and 2 of the Pinedale SEEP, community partners will be identified and trained to conduct installations and provide support to the community with regards to solar products. Further, the large-scale distribution of solar lights throughout the Pinedale Chapter will increase community buy-in and will help educate the residents about the problem.
3. Development of multi-stakeholder partnerships and leveraging of resources: Eagle Energy will partner with diverse groups to help clarify a common vision, develop a clear plan for implementation and to identify additional partners to collaborate with. For the Pinedale SEEP, Eagle Energy will partner with the Pinedale Chapter government, Namaste Solar, and the Colorado School of Public Health at the University of Colorado Denver. Through community meetings, advisory team meetings and stakeholder-specific gatherings, Eagle Energy will continue to engage these diverse groups, ensuring that partnerships are strengthened, resources

are leveraged and new partnerships are forged.
4. Consensus building and dispute resolution: As a trusted partner of Pinedale Chapter, Eagle Energy is familiar with the process of consensus building and, when necessary, dispute resolution with residents and partner organizations. Eagle Energy designs processes to ensure the fair and meaningful participation of all stakeholders, promotes the establishment of common ideas, helps foster agreement and is willing to engage neutral facilitators if disputes arise that would benefit from an outside mediator.
5. Constructive engagement with other stakeholders: Recognizing that local government involvement is crucial for the sustainability of long-term efforts, Eagle Energy will continue to engage the Pinedale Chapter in the implementation of the SEEP. Further, Eagle Energy's partnership with Namaste Solar and with the University of Colorado Denver represent important cross-sector engagement that will help make the Pinedale SEEP a success.
6. Sound management and implementation: To ensure sound management and implementation, Eagle Energy and its partners will create clear workplans that emphasize both the long-term goals of eliminating kerosene, generator and battery use and reducing air pollution, as well as the short-term goals of increasing awareness of the problem, building community capacity to confront the challenge and installing solar heaters, lights and chargers to begin the process of reducing the environmental and public health concern. With project managers on the ground in Pinedale, and with oversight by Eagle Energy, the implementation of the Pinedale SEEP will be closely monitored to ensure milestones are reached and tasks are delegated appropriately.
7. Evaluation: As an organization that is committed to continuously evaluating to better meet community needs, Eagle Energy conducts periodic progress evaluations in all of its work. By reviewing lessons learned, describing measures of success and by revising program implementation to mirror best practices and lessons learned, the Pinedale SEEP will remain a flexible program that is responsive to community needs, while keeping the project outcomes in mind.

The Pinedale SEEP will **increase the community's capacity to address the local environmental and public health issue** through data collection, education, and through training on the retrofitting, installation and upkeep of solar heaters, lights and chargers.

Roles of partners. Eagle Energy will partner with numerous organizations in the implementation of the Pinedale SEEP. The following chart outlines each partner and its role in the project:

Name	**Eagle Energy**
Role	Project Lead
Nature of partnering organization	With over three years of experience partnering with the Navajo Nation and the Pinedale Chapter specifically, Eagle Energy's goal is to eradicate the use of kerosene, propane and battery use for lighting on the Navajo Nation.
Resources brought to partnership	Lessons learned from previous renewable energy initiatives on the Navajo Nation and in Namibia; and staff expertise on the ground in the Navajo Nation.
Commitments made	Project management; 40 hours per month of contributed in-kind staff time to support the project; and dedication to CPS process with partners and community.

Activities	Fiscal management of the grant; directing the collection of public health and environmental data; supervising the project managers in Pinedale; and partnering with the EPA for the requirements as a Cooperative Agreement.
Name	**Pinedale Chapter**
Role	Government partner
Nature of partnering organization	As the local government entity, the Pinedale Chapter has a vested interest in the success of the SEEP, as it directly impacts the Chapters' 2015–2020 Infrastructure Capital Improvement Plan
Resources brought to partnership	Community connections and support; expertise in the local community.
Commitments made	20 hours per month of contributed in-kind staff time; contributed in-kind office supplies and marketing materials.
Activities	Programmatic and implementation support, including initial needs assessment and collection of baseline data.
Name	**Namaste Solar**
Role	Implementation Partner
Nature of partnering organization	Founded in 2005, the mission of Namaste Solar is "to propagate the responsible use of solar energy, pioneer conscientious business practices, and create holistic wealth for ourselves and our community." Known as one of Colorado's top solar installers, Namaste builds solar systems and is frequently asked to develop creative approaches to technical problems.
Resources brought to partnership	Expertise in retrofitting, installing and monitoring solar heaters.
Commitments made	In-kind contribution of 90 solar air collector panels, technical assistance with the training and installation of solar heaters in Pinedale.
Activities	Provide support and technical assistance with the training of installers
Name	Colorado School of Public Health at the University of Colorado Denver
Role	Research Support
Nature of partnering organization	Formed in 2008, the Colorado School of Public Health is an accredited, collaborative school of public health that seeks to create healthier futures, build stronger partnerships and steward shared resources for the betterment and health of communities in Colorado and around the world.
Resources brought to partnership	Expertise in indoor air quality monitoring and emissions testing.
Commitments made	Staff, faculty and students from the School of Public Health will act as advisors for the development of baseline and follow-up public health surveys; Faculty from the School will help identify students to participate in field practicums in Pinedale; and the School of Public Health will work with project partners to help explore the public health implications of clean energy.

Activities	Advise on development of pre- and post-surveys to monitor and assess energy use, indoor air pollution and other outcomes.

V. Organizational Capacity and Programmatic Capability.

Past performance and administrative systems. Eagle Energy will work with project managers on the ground to ensure the appropriate management of federal grant funds. Elephant Energy has an eleven-member Board of Directors that provides oversight in all financial management decisions, including approval of its annual budget, which was over $500,000 in 2013. Elephant Energy utilizes the services of a bookkeeper who handles accounting and ensures that proper reporting to the Internal Revenue Service is maintained. Income and expenditures are recorded in QuickBooks each month, which allows for efficient reporting between various donors and projects. Elephant Energy also has an accountant who assists in filing annual income taxes.

The successes of Elephant Energy's projects demonstrate its ability to manage grant funds effectively. In addition to its work on the Navajo Nation, since 2008, Elephant Energy has distributed over 10,000 solar-powered lights via rural entrepreneurs networks and disaster-relief programs in Africa. These sales and distributions have been made possible by numerous grants from private foundations, government agencies, and individual donors. As past performance will illustrate, Elephant/Eagle Energy has successfully administered over $300,000 in grant funding in the last two years. Further, in 2014 Elephant Energy was awarded a highly competitive $500,000 grant from the U.S. Agency for International Development to pilot an innovative new pay-as-you-go solar technology in Namibia. All of these grants required the production of detailed evaluation reports. On the Navajo Nation, Eagle Energy and its partners have worked together to distribute over 1,000 solar-powered lights through chapter houses, rural entrepreneurs, and schools with funding from the University of Colorado and individual donors.

Plan for timely and successfully achieving the objectives. Eagle Energy has experience implementing federal and non-federal grants and will timely and successfully achieve the proposed objectives. Eagle Energy has created a realistic implementation timeline that will allow the organization to scale-up quickly, while also ensuring the partner organizations and the affected community are actively engaged in the CPS process.

Pinedale SEEP staff have the expertise, knowledge and resources required to successfully achieve the goals of the project. As past performance reports will indicate, Eagle Energy has successfully staffed and completed all previous grant-funded initiatives. While participation in this Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program would represent Eagle Energy's first partnership with the EPA, performance reports from other funders are available upon request.

In addition to Project Managers (described below), the following qualified staff will be involved in the implementation of the Pinedale SEEP:
Adrian Manygoats is from Tuba City, on the Diné (Navajo) Nation. As one of Eagle Energy's Project Managers, Adrian oversees all field operations in the Western Agency. Her personal mission is to empower indigenous people to lead by example and to do meaningful work for future generations. With a degree in women's and gender studies, and an emphasis in applied indigenous studies, Adrian began working with Eagle Energy through the Navajo Women's

Empowerment Project.

Tim Willink is from Pueblo Pintado, on the Diné (Navajo) Nation in Northwest New Mexico. Tim is a North American Board of Certified Energy Practitioners certified photovoltaic solar installer at Namasté Solar, with experience in both residential and commercial projects. Before joining Namasté, Tim worked as a Legislative Associate for the Diné Nation Washington Office where he specialized in economic development and education. Tim has also worked as a community organizer on both Hopi and Diné lands.

Angeline Burnside is the Chapter Coordinator for Pinedale Chapter. Angie has worked with Eagle Energy since 2010 to gain community support for solar energy in Pinedale Chapter. In addition, Angie has connected Eagle Energy with numerous recipients of solar technologies in the past and participated in installations of solar systems on off-grid households.

Elizabeth Carlton is an environmental epidemiologist with the Colorado School of Public Health. She has participated in the design of studies to evaluate the impacts of environmental hazards and interventions on health outcomes in low-income communities for over a decade.

VI. Qualifications of Project Manager

Melton Martinez, the proposed project manager, will manage the Pinedale SEEP on the ground, and has nearly 20 years of experience working on successful community-oriented environmental justice projects in the area targeted under this proposal. As president of the Eastern Navajo Uranium Workers, and in conjunction with Diné CARE, Mr. Martinez successfully advocated for the extension of Federal compensation rights for Navajo uranium miners and their families. Mr. Martinez has substantial relationships with communities in the area targeted by the Pinedale SEEP and was born and raised and currently resides in Baca Chapter, a neighboring Navajo chapter. His constant and relentless advocacy for various environmental and social rights of Navajo communities has afforded him the opportunity to build relationships with various government officials and community leaders on local, tribal, state, and federal levels. Mr. Martinez has also worked with Eagle Energy and Pinedale Chapter since 2010 to educate Chapter members about solar energy and install solar energy and heating systems.

Doug Vilsack, the proposed project director, will assist with grant administration and reporting, and is the founder of Elephant/Eagle Energy, was its first Executive Director and now serves as the Chairman of the Board of Directors. Before founding Elephant/Eagle Energy, Mr. Vilsack was a practicing lawyer working in the areas of environmental law, Indian law, and renewable and alternative energy law. In his capacity as director of Elephant/Eagle Energy, he has helped administer grants of up to $500,000, including reporting on federal grants. Mr. Vilsack has been involved with environmental issues on the Navajo Nation for nearly a decade as an activist, a lawyer, and an entrepreneur. Mr. Vilsack is now the Executive Director of the Posner Center for International Development, a shared workspace in Denver, Colorado for international development organizations

VII. Past Performance in Reporting on Outputs and Outcomes

Federal or non-Federal grants or cooperative agreements. Elephant Energy has administered the following federal and non-federal grants or cooperative agreements in the previous three

years:

1. Solar for All Partnership (Energy and Environment Partnership Program with Southern and Eastern Africa, NAM4001: Solar for All Partnership)

In 2012, Elephant Energy received a €176,900.00 (over $200,000 USD) grant from the Solar for All Partnership, a programme funded by the Governments of Finland, Austria, United Kingdom and hosted by the Development Bank of Southern Africa (DBSA). Contact: Anni Korhonen, info@eepafrica.org

2. Solar Energy Empowerment Project (Grand Canyon Trust)

In 2012, Eagle Energy received $26,000 from the Grand Canyon Trust to implement the pilot SEEP in the Western Agency of the Navajo Nation. This successful project has paved the way for much of Eagle Energy's pending work in the Eastern Agency. Contact: Roger Clark, rclark@grandcanyontrust.org

3. Namibia Flood-Relief Energization Plan (USAID Grant No. AID-674-11-00001)

Elephant Energy received a $70,000 grant from U.S. Agency for International Development in 2011 to provide 2,300 solar-powered lights to flood victims in Namibia. The project involved working with partners to distribute solar-powered lights in six Regions, stretching over 800 miles in Northern Namibia. Contact: Debra Mosel, dmosel@usaid.gov

How progress is documented and/or reported. In previous assistance agreements, progress was documented and reported using standard funder-mandated reporting features. Elephant/Eagle Energy has successfully managed grants to achieve expected outputs and outcomes in prior agreements. Through its pilot programs and subsequent initiatives on the Navajo Nation, Eagle Energy has conducted formal and informal program evaluation, much of which has contributed to securing additional funding. As evidenced by continued investment by the University of Colorado, Elephant Energy has demonstrated that it is an effective partner. Further, in partnership with various international funders, Elephant Energy has been required to submit monthly progress reports demonstrating progress towards achieving outcomes and demonstrating effective spend-down of grant funds.

In addition to Elephant Energy's commitment to effective and efficient grant reporting, the organization is committed to publishing its work for broader consumption and in order to contribute to a growing body of international literature about the effects of clean technology. Many of Elephant Energy's reports are available online, including Eagle Energy's 2013 progress reports, which provides thorough documentation of the successes and growth of projects and programs throughout the Navajo Nation.

VIII. Expenditure of Awarded Grant Funds

Approach, procedures, and controls. Elephant Energy has a detailed financial management plan and has reported on numerous federal grants–domestically and internationally–in the past. The following procedures and controls are in place to ensure grant funds are expended in a timely and efficient manner:

1. Effective project management and project planning, including weekly meetings with the project managers, will ensure appropriate workplans are developed and that they reflect the desired outcomes of the Pinedale SEEP
2. QuickBooks is used for all financial management and to ensure the organization spending grant funds effectively

3. Financial oversight, provided by the eleven member Board of Directors and a contract accountant, will be conducted
4. Elephant Energy will maintain clear and open lines of communication with its point of contact at the EPA, to ensure all project and financial milestones are being monitored and achieved

IX. Quality Assurance Project Plan (QAPP) Information. The Pinedale SEEP may require the *collection of groundwater, soil, sediment, surface water, air, biota or fauna samples for chemical or biological analysis.* If so, Eagle Energy will work with the EPA to develop an appropriate Quality Assurance Project Plan (QAPP).

Project Performance Measures/Milestones. Eagle Energy plans to track three key metrics to assess the impact of the Pinedale SEEP: impact on indoor air quality in participating homes; the average amount of energy consumed and the subsequent financial savings experienced by customers who receive a solar air collector system; and the total number of individuals who become fully trained to perform every aspect of solar air collector installation. For precise measures and milestones, please review the logic model.

Measures that relate directly to the local environmental and/or public health. The Pinedale SEEP seeks to improve air quality in the Pinedale community by reducing the use of wood, kerosene, propane and batteries for lighting and heat in homes. As the data indicate, the indoor use of wood-burning stoves and kerosene lamps contribute to poor indoor air quality and negative environmental and public health outcomes. For each kerosene lamp that is eliminated from use on the Navajo Nation, 100 kilograms of CO_2 emissions are saved from entering the environment each year. The widespread electrification of the Pinedale Chapter with clean energy technologies has the potential to reduce emissions by up to 20,000 kilograms per year. Put in perspective, it would take 1,000 new trees to eliminate this level of CO_2. To monitor the local environmental and public health impacts, Eagle Energy will work with advisors from the Colorado School of Public Health to develop, administer and analyze surveys assessing condition changes in participating households.

Well aligned with the Collaborative Problem Solving process–and because cultural and political realities in Pinedale have the potential to make residents skeptical of research–the Pinedale SEEP will actively involve community members in the design and administration of pre- and post-surveys. This collaborative design process will ensure that the data collected meets the needs of the project, while also building the capacity of the community to understand the public health challenge and creative approaches to solving it.

Approach for determining how and whether progress is made. Working with its partners in Pinedale, Eagle Energy will collect data to determine how progress is made in achieving the expected project outcomes and outputs. Output tracking (the recruiting and training of installers; installation of solar heaters, lights and chargers; the number of households impacted) will be conducted by the project managers, who have access to products and who will be responsible for the recruiting and on-boarding of installers. Outcomes (economic and environmental changes) will be monitored through the development, distribution and analysis of baseline and final surveys and in-person interviews with customers/product recipients.